UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
WASHINGTON, D.C.

and

BEET SUGAR DEVELOPMENT FOUNDATION
DENVER, COLORADO

and

MICHIGAN AGRICULTURAL EXPERIMENT STATION
MICHIGAN STATE UNIVERSITY
EAST LANSING, MICHIGAN

NOTICE OF RELEASE OF EXPERIMENTAL SUGARBEET GERMPLASM EL-X2 WITH SELECTION FOR APHANOMYCES RESISTANCE

The Agricultural Research Service of the U. S. Department of Agriculture, the Beet Sugar Development Foundation, and Michigan State University announce the joint release of experimental sugarbeet germplasm EL-X2. This experimental germplasm was last selected at the Betaseed, Inc. Aphanomyces nursery in Shakopee, MN in 2003 by Margaret Rekoske and Jay Miller, followed by seed production at Shakopee, MN in 2004. The derivation of this material has the goal of understanding and broadening the genetic base for Aphanomyces resistance in sugar beet. This line may be useful for a number of basic and applied investigations, and limited quantities of seed are available to facilitate further testing and development of these and additional goals. In particular, EL-X2 is a sugar beet counterpart to releases EL-X1, EL-X3, and EL-X4 that were developed simultaneously with EL-X2 to examine introgression of Aphanomyces resistance from wild germplasm.

Construction and evaluation of original and derived materials was done in the program of J. Mitchell McGrath, USDA-ARS East Lansing, MI beginning in 1997. This line is suitable for variety development. In 2003, 64 genetically similar entries, standards and the sugarbeet parents were tested in the Shakopee Aphanomyces nursery and rated on a 1 (resistant) to 9 (susceptible) scale. The average rating of two Aphanomyces tolerant and two susceptible standards was 2.0 and 7.0, respectively (LSD0.05=1.83, average of two late readings), the sugar beet parents SP6822 and 6869 had scores of 1.0 and 5.5, respectively, and EL-X2 scored 4.5. From this nursery in 2003, approximately 20 roots were selected for improved root conformation and relative freedom from disease. Subsequently seed of each release was produced by inter-pollination of the selected plants the following year.

SP6822 (PI 615525) is a traditional Aphanomyces resistance source and 6869 (a progenitor of C869, PI 628754) is the donor of the self-fertility (Sf) and nuclear male sterility characters, were used as sugar beet parents. EL-X2 is expected to be self-fertile and segregating for nuclear male sterility.

EL-X2 (4PS1927) was constructed from a cross between a single male sterile plant of 6869 and a single plant of SP6822 as its pollinator. F1 seed from this cross was planted in the 1998 observation nursery in Saginaw, MI, and one plant, designated 98B001-26, was selected for plant vigor, and selfed S2 seed was produced in the 1999 greenhouse. S2 seed was planted in the 2000 Saginaw Valley Bean and Beet Farm seedling disease nursery, and three roots designated 00B031-1 to -3 were selected as free from disease at the end of the season, and inter-crossed to give rise to the seed from which EL-X2 was selected in

Shakopee, MN. EL-X2 serves as a comparison for Aphanomyces tolerance relative to the other releases here that used WB879 or WB185 in their lineage, relative to the traditional high level of resistance shown by SP6822.

EL-X (for experimental) lines are being released as germplasm resources for breeders to use in developing parental lines with potentially new sources of resistance to diseases caused by Aphanomyces. These lines also contain a series of useful characters at low allele frequencies derived from the parent's components, such as those necessary to breed for seed parents used to create cytoplasmic male sterility-mediated hybrids. Seed will be available for use by writing to Dr. J. Mitchell McGrath, USDA-ARS, 494 PSSB, Michigan State University, East Lansing, MI 48824-1325 (mitch.mcgrath@ars.usda.gov). Genetic material of this release will be deposited in the National Plant Germplasm System where it will be available for research purposes, including development and commercialization of new cultivars. Efforts of Yi Yu, Tim Duckert, and Teresa Koppin as well as Betaseed, Inc. in generating these materials are gratefully acknowledged. It is requested that the author be notified if this germplasm contributes to the development of a new breeding line or cultivar. U.S. Plant Variety Protection will not be requested.

Signatures:

Executive Vice President
Beet Sugar Development Foundation

4/14/09
Date

Director, Michigan Agricultural Experiment Station
Michigan State University

5/7/09
Date

Deputy Administrator, Crop Production and Protection
Agricultural Research Service, U.S. Department of Agriculture

5/19/09
Date